

**meoprobit postestimation** — Postestimation tools for meoprobit

<a href="#">Description</a>	<a href="#">Syntax for predict</a>	<a href="#">Menu for predict</a>
<a href="#">Options for predict</a>	<a href="#">Syntax for estat group</a>	<a href="#">Menu for estat</a>
<a href="#">Remarks and examples</a>	<a href="#">Methods and formulas</a>	<a href="#">Also see</a>

## Description

The following postestimation command is of special interest after `meoprobit`:

Command	Description
<code>estat group</code>	summarize the composition of the nested groups

The following standard postestimation commands are also available:

Command	Description
<code>contrast</code>	contrasts and ANOVA-style joint tests of estimates
<code>estat ic</code>	Akaike's and Schwarz's Bayesian information criteria (AIC and BIC)
<code>estat summarize</code>	summary statistics for the estimation sample
<code>estat vce</code>	variance–covariance matrix of the estimators (VCE)
<code>estimates</code>	cataloging estimation results
<code>lincom</code>	point estimates, standard errors, testing, and inference for linear combinations of coefficients
<code>lrtest</code>	likelihood-ratio test
<code>margins</code>	marginal means, predictive margins, marginal effects, and average marginal effects
<code>marginsplot</code>	graph the results from margins (profile plots, interaction plots, etc.)
<code>nlcom</code>	point estimates, standard errors, testing, and inference for nonlinear combinations of coefficients
<code>predict</code>	predictions, residuals, influence statistics, and other diagnostic measures
<code>predictnl</code>	point estimates, standard errors, testing, and inference for generalized predictions
<code>pwcompare</code>	pairwise comparisons of estimates
<code>test</code>	Wald tests of simple and composite linear hypotheses
<code>testnl</code>	Wald tests of nonlinear hypotheses

## Special-interest postestimation commands

`estat group` reports the number of groups and minimum, average, and maximum group sizes for each level of the model. Model levels are identified by the corresponding group variable in the data. Because groups are treated as nested, the information in this summary may differ from what you would get if you used the `tabulate` command on each group variable individually.

## Syntax for predict

Syntax for obtaining predictions of random effects and their standard errors

```
predict [type] newvarsspec [if] [in], { remeans | remodes } [reses(newvarsspec) ]
```

Syntax for obtaining other predictions

```
predict [type] newvarsspec [if] [in] [, statistic options ]
```

*newvarsspec* is *stub\** or *newvarlist*.

<i>statistic</i>	Description
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Main	
<code>pr</code>	predicted probabilities; the default
<code>fitted</code>	fitted linear predictor
<code>xb</code>	linear predictor for the fixed portion of the model only
<code>stdp</code>	standard error of the fixed-portion linear prediction

These statistics are available both in and out of sample; type `predict ... if e(sample) ...` if wanted only for the estimation sample.

<i>options</i>	Description
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Main	
<code>means</code>	compute <i>statistic</i> using empirical Bayes means; the default
<code>modes</code>	compute <i>statistic</i> using empirical Bayes modes
<code>nooffset</code>	ignore the offset variable in calculating predictions; relevant only if you specified <code>offset()</code> when you fit the model
<code>fixedonly</code>	prediction for the fixed portion of the model only
<code>outcome(<i>outcome</i>)</code>	outcome category for predicted probabilities
Integration	
<code>intpoints(#)</code>	use # quadrature points to compute empirical Bayes means
<code>iterate(#)</code>	set maximum number of iterations in computing statistics involving empirical Bayes estimators
<code>tolerance(#)</code>	set convergence tolerance for computing statistics involving empirical Bayes estimators

You specify one or *k* new variables in *newvarlist* with `pr`, where *k* is the number of outcomes. If you do not specify `outcome()`, those options assume `outcome(#1)`.

## Menu for predict

Statistics > Postestimation > Predictions, residuals, etc.

## Options for predict

### Main

`remeans`, `remodes`, `reses()`; see [ME] [meglm postestimation](#).

`pr`, the default, calculates the predicted probabilities. By default, the probabilities are based on a linear predictor that includes both the fixed effects and the random effects, and the predicted probabilities are conditional on the values of the random effects. Use the `fixedonly` option if you want predictions that include only the fixed portion of the model, that is, if you want random effects set to 0.

You specify one or  $k$  new variables, where  $k$  is the number of categories of the dependent variable. If you specify the `outcome()` option, the probabilities will be predicted for the requested outcome only, in which case you specify only one new variable. If you specify one new variable and do not specify `outcome()`, `outcome(#1)` is assumed.

`fitted`, `xb`, `stdp`, `means`, `modes`, `nooffset`, `fixedonly`; see [ME] [meglm postestimation](#).

By default or if the `means` option is specified, statistics `pr`, `fitted`, `xb`, and `stdp` are based on the posterior mean estimates of random effects. If the `modes` option is specified, these statistics are based on the posterior mode estimates of random effects.

`outcome(outcome)` specifies the outcome for which the predicted probabilities are to be calculated. `outcome()` should contain either one value of the dependent variable or one of `#1`, `#2`, ..., with `#1` meaning the first category of the dependent variable, `#2` meaning the second category, etc.

### Integration

`intpoints()`, `iterate()`, `tolerance()`; see [ME] [meglm postestimation](#).

## Syntax for estat group

`estat` group

## Menu for estat

Statistics > Postestimation > Reports and statistics

## Remarks and examples

[stata.com](http://www.stata.com)

Various predictions, statistics, and diagnostic measures are available after fitting an ordered probit mixed-effects model using `meoprobit`. Here we show a short example of predicted probabilities and predicted random effects; refer to [ME] [meglm postestimation](#) for additional examples applicable to mixed-effects generalized linear models.

## ▷ Example 1

In example 2 of [ME] **meoprobit**, we modeled the tobacco and health knowledge (thk) score—coded 1, 2, 3, 4—among students as a function of two treatments (cc and tv) using a three-level ordered probit model with random effects at the school and class levels.

```
. use http://www.stata-press.com/data/r13/tvsfpor
. meoprobit thk prethk cc##tv || school: || class:
(output omitted)
```

We obtain predicted probabilities for all four outcomes based on the contribution of both fixed effects and random effects by typing

```
. predict pr*
(predictions based on fixed effects and posterior means of random effects)
(option mu assumed)
(using 7 quadrature points)
```

As the note says, the predicted values are based on the posterior means of random effects. You can use the `modes` option to obtain predictions based on the posterior modes of random effects.

Because we specified a stub name, Stata saved the predicted random effects in variables `pr1` through `pr4`. Here we list the predicted probabilities for the first two classes for school 515:

```
. list class thk pr? if school==515 & (class==515101 | class==515102),
> sepby(class)
```

	class	thk	pr1	pr2	pr3	pr4
1464.	515101	2	.1503512	.2416885	.2828209	.3251394
1465.	515101	2	.3750887	.2958534	.2080368	.121021
1466.	515101	1	.3750887	.2958534	.2080368	.121021
1467.	515101	4	.2886795	.2920168	.2433916	.1759121
1468.	515101	3	.2129906	.2729831	.2696254	.2444009
1469.	515101	3	.2886795	.2920168	.2433916	.1759121
<hr/>						
1470.	515102	1	.3318574	.2959802	.2261095	.1460529
1471.	515102	2	.4223251	.2916287	.187929	.0981172
1472.	515102	2	.4223251	.2916287	.187929	.0981172
1473.	515102	2	.4223251	.2916287	.187929	.0981172
1474.	515102	2	.3318574	.2959802	.2261095	.1460529
1475.	515102	1	.4223251	.2916287	.187929	.0981172
1476.	515102	2	.3318574	.2959802	.2261095	.1460529

For each observation, our best guess for the predicted outcome is the one with the highest predicted probability. For example, for the very first observation in the table above, we would choose outcome 4 as the most likely to occur.

We obtain predictions of the posterior means themselves at the school and class levels by typing

```
. predict re_s re_c, remeans
(calculating posterior means of random effects)
(using 7 quadrature points)
```

Here we list the predicted random effects for the first two classes for school 515:

```
. list class re_s re_c if school==515 & (class==515101 | class==515102),
> sepby(class)
```

	class	re_s	re_c
1464.	515101	-.0340769	.0390243
1465.	515101	-.0340769	.0390243
1466.	515101	-.0340769	.0390243
1467.	515101	-.0340769	.0390243
1468.	515101	-.0340769	.0390243
1469.	515101	-.0340769	.0390243
1470.	515102	-.0340769	-.0834322
1471.	515102	-.0340769	-.0834322
1472.	515102	-.0340769	-.0834322
1473.	515102	-.0340769	-.0834322
1474.	515102	-.0340769	-.0834322
1475.	515102	-.0340769	-.0834322
1476.	515102	-.0340769	-.0834322

We can see that the predicted random effects at the school level (`re_s`) are the same for all classes and that the predicted random effects at the class level (`re_c`) are constant within each class.

◀

## Methods and formulas

Methods and formulas for predicting random effects and other statistics are given in *Methods and formulas* of [ME] [meglm postestimation](#).

## Also see

[ME] [meoprobit](#) — Multilevel mixed-effects ordered probit regression

[ME] [meglm postestimation](#) — Postestimation tools for meglm

[U] [20 Estimation and postestimation commands](#)